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CERTIFICATE

This certificate is issued in support of an application for Patent registration in a country outside New Zealand pursuant to the Patents Act 1953 and the Regulations thereunder.

I hereby certify that annexed is a true copy of the Provisional Specification as filed on 28 June 2002 with an application for Letters Patent number 519877 made by ENERGY AND TECHNICAL SERVICES LIMITED.

Dated 7 July 2003.

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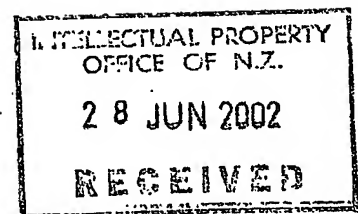
PROVISIONAL SPECIFICATION

15

ENERGY USAGE EVALUATION SYSTEM AND METHOD

We, **ENERGY AND TECHNICAL SERVICES LIMITED**, a New Zealand company, of PO Box 6004, Wellington, New Zealand, do hereby declare this invention

20 to be described in the following statement:



ENERGY USAGE EVALUATION SYSTEM AND METHOD

FIELD OF INVENTION

- 5 The invention relates to an energy usage evaluation system and method, particularly but not solely designed for measuring the energy and environmental efficiency of a facility and comparing it to benchmarks established from other like facilities.

BACKGROUND TO INVENTION

10

Environmental issues are becoming ever more important in the running and administration of facilities and estates. Good information and benchmarks can greatly aid in identifying opportunities for improving efficiency and achieving cost savings. Such information is good for an organisation's bottom line and good for the organisation's

15 country as a whole.

There are several tasks which must be performed when conducting a benchmarking exercise for an organisation to ensure that valid comparisons are being made. These tasks include selecting a subject area, defining a process to be benchmarked, identifying

20 potential benchmarking partners and identifying data required, the sources and appropriate methods of collection. A data analysis phase includes the steps of collecting the data and selecting benchmarking partners, determining the performance gap, establishing the difference in the process, and targeting future performance. Many of these tasks, such as identifying benchmarking partners, can be very time-consuming and

25 difficult.

Japanese patent specification JP 2002-007523 to Osaka Gas Co Limited entitled "Evaluation System for Consumer Energy Facility" describes the comparison of energy facilities. These energy facilities include air conditioning equipment, hot water supply,

30 gas turbines, gas engines, absorption-type cold calorifier, fuel cells, co-generation plants, combined cycle equipment, etc. A facility is described in this patent specification as a

particular electrical device. These specific devices are compared with benchmarks to simulate energy usage for overall site usage. The specification does not describe the benchmarking of one facility, which could include several devices, with other like facilities.

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SUMMARY OF INVENTION

In one form the invention comprises a method of evaluating energy usage of an organisation comprising the steps of storing in computer memory data representing one or more sites operated by the organisation; storing in computer memory data representing one or more facilities, each site comprising one or more of the facilities; storing in computer memory data representing one or more energy sources, each facility using one or more of the energy sources; calculating the energy consumption from each energy source for each facility; and generating a report detailing the energy consumption of one or more of the facilities of the organisation.

Preferably the method further comprises the steps of comparing the energy consumption of one or more of the facilities with the energy consumption of respective benchmark standards generating from similar facilities; and generating a report detailing the difference between energy consumption of one or more of the facilities and their respective benchmark standards.

In another form in broad terms the invention comprises an energy usage evaluation system comprising a client data store in which is stored data representing one or more sites operated by an organisation, data representing one or more sites operated by an organisation, data representing one or more facilities, each site comprising one or more of the facilities, and data representing one or more energy sources, each facility using one or more of the energy sources; an energy consumption calculator configured to calculate the energy consumption from each energy source for each facility; and a report generator configured to generate a report detailing the energy consumption of one or more of the facilities of the organisation.

Preferably the system further comprises a benchmark database including data representing the energy consumption of respective benchmark standards with which the energy consumption of one or more of the facilities can be compared.

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BRIEF DESCRIPTION OF THE FIGURES

Preferred forms of the energy usage evaluation system and method will now be described with reference to the accompanying figures in which:

10

Figure 1 is schematic representation of typical organisations to be evaluated in accordance with the invention;

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Figure 2 shows a block diagram of a preferred Internet-based system in which the present invention can be implemented;

Figure 3 shows a preferred system architecture of a client or web server from Figure 2;

Figure 4 shows a data capture process in accordance with the invention;

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Figure 5 shows another preferred form data capture process for calculating an energy map;

Figure 6 shows sample data obtained by one step of the process of Figure 5;

25

Figure 7 shows further sample data generated from a step in the process of Figure 5; and

Figures 8-16 show preferred form fields for the client data store and/or benchmark database shown in Figure 2.

30

DETAILED DESCRIPTION OF PREFERRED FORMS

Figure 1 illustrates typical organisations which the invention is configured to evaluate. Organisation 10, for example, could include one or more sites, for example site 20 and site 30. Each site is generally confined to a geographic area and could include one or more individual facilities, for example, site 20 includes facility 22, 24 and 26 whereas site 30 includes facility 32 and 34. Where the organisation is a university, each university campus would be considered to be site, having one or more individual facilities, for example buildings. Organisation 40 could include just one site 50 which in turn could include just one facility 52.

Organisation 60 could include one site 70 and this site could include facilities 72, 74 and 76.

Each site could draw energy from one or more energy sources, for example networked energy sources such as reticulated gas 80 or electricity 82 or on-site energy sources such as bottled gas 84 or coal 86. It is also envisaged that energy sources could include diesel, on-site solar generation, biomass, and other energy sources.

It is envisaged that each site may have different metering facilities. Site 20, for example, could include meter 90 to identify the consumption of electricity from electricity source 82. In this case, site 20 has no sub-metering and so meter 90 measures the energy coming onto the site 20 but not its distribution around different facilities 22, 24 and 26. In contrast, meter 92 calculates the consumption of electricity from energy source 82 for site 30. Meter 92 is connected to sub-meters 94 and 96 to calculate the energy consumed by facilities 32 and 34 respectively.

Site 50 could include meter 98 measuring consumption of electricity from energy source 82 for site 50. Site 50 could also include meter 100 for measuring consumption of gas from energy source 80.

Site 70 could include meter 102 for measuring consumption of electricity from energy source 82. Site 70 includes limited sub-metering. The total energy consumed by the combination of facilities 72, 74 and 76 are measured by meter 102. Sub-meter 104 measures the consumption of facility 72 only.

5

Meter 106 measures the consumption of energy from energy source 80 for facilities 74 and 76 and sub-meters 108 and 110 measure the individual consumption of facilities 74 and 76 respectively.

10 Figure 2 illustrates a block diagram of the preferred Internet-based system 200 in which the present invention may be implemented. The system includes one or more clients 210, for example clients 210A, 210B and 210C, which each may comprise a personal computer or workstation which will be described below. Each client 210 is interfaced to the Internet 220 and is configured to enable a user access to web browsing software. As
15 shown in Figure 2, each client 210 could be connected directly to the Internet 220 with a suitable dial-up connection or could be connected through a local area network or LAN. Client 210C is shown as connected to the Internet 220 with a dial-up connection. Clients 210A and 210B, on the other hand, are connected to a network 230 such as a local area network or LAN. The network 230 could be connected to a suitable network server 240
20 and communicate with the Internet 220 as shown.

The system 200 also includes a suitable web server 250 connected to the Internet 220 as shown in Figure 2. The web server 250 preferably comprises a personal computer or workstation operating under the control of suitable software. Connected to web server
25 250 is a client data store 260. Software operating on the web server 250 is configured to obtain energy consumption data from a client 210 and to store this energy consumption data in the client data store 260. The system 200 also includes an energy consumption calculator which in one form could be a software programme which is configured to calculate energy consumption of a client organisation from data supplied from the client
30 210. A benchmark database 280 stores energy consumption data from several different types of facilities belonging to an organisation and an energy consumption comparer 290

compares consumption data relating to client facilities from the client data store 260 and the energy consumption calculator 270 with data stored in the benchmark database 280. A report generator 300 generates reports on energy consumption ready to transmit to the client 210.

5

Figure 3 shows the preferred system architecture of a client 210, or web server 250. The computer system 400 typically comprises a central processor 402, a main memory 404, an input/output controller 406, a keyboard 408, a pointing device 410 for example a mouse or touch sensitive screen, a display or screen device 412, a mass storage memory 414, for example a hard disk, floppy disk or optical disc, and an output device 416, for example a printer. The computer system 400 could also include a network interface card or controller 418 and/or a modem 420. The individual components of system 400 could communicate through a system bus 422.

10

Figure 4 illustrates the data capture process for a user wishing to benchmark one or more facilities. The user first completes a log-in screen 500 requiring entry of a user ID and password for example. It is envisaged that the client data store 260 store data relating to more than one user and that the log-in screen permits a user to be uniquely identified and that the user may only access data relating to the user's own organisation.

20

The user is then required to enter organisation details. On first use of the system, it is envisaged that the user will need to complete details about the user organisation. This is fairly basic information and includes information such as website address, postal address, the type of organisation and so on. It is envisaged that some of this information will already have been entered by the operator of the web server when setting up the user account. In a preferred form, the user is able to change data already entered in the case where organisation details have changed, for example through a merger process.

25

The user may also need to enter contact details 520. In one preferred form there are three types of contacts, namely primary, basic and read only. Each organisation has one primary contact which is the person with whom the usage agreement has been made and

30

will be the only person authorised to approve new users being added to the system. A basic user has access to all the information for the organisation and can add, update and change information as necessary and download all reports. The third category, read only, is for a user who can only look at the information and download reports. A read only user is not able to update or change any information. A read only category could be useful for an organisation that does not want people from outside the organisation to modify confidential information.

The user then enters site details 530 in order to identify all the sites run by a user organisation. The user is also required to specify whether the site is a single facility site or a multiple facility site. If it is a multiple facility site, it is necessary to determine what level of sub-metering the facility has for measuring energy use at individual facilities. If the site has several different facilities, the user could be provided with an option to create an energy map of the site which lists all the facilities, all the meters and energy sources and then correlates them. An energy map could be particularly important where there is some sub-metering on the site. The energy map is described further below.

The user then enters meter details 540. The meter for the purposes of the invention could be either the actual metering equipment in place on reticulated electricity and gas such as that shown in Figure 1, or alternatively could include a theoretical point to measure the use of un-metered energy sources such as diesel, coal or bottled gas.

The invention permits an unlimited number of meters per facility to account for all energy sources, for example electricity, gas, diesel for generators and so on. The invention also allows for an unlimited number of facilities per meter to allow for sites with multiple facilities and limited sub-metering which is described below.

The configuration of which facilities are supplied from which meters may change as new meters are installed and old meters are removed. The invention envisages this arrangement by having a start and end date for each specific facility/meter relationship.

It is also envisaged that there are two levels of meters as described above in Figure 1, for example site meters and sub-meters. Site meters are used to aggregate information for the site in total, whereas the sub-meters are used to measure energy usage at individual facilities.

5

A single facility site is a site which has only a single facility. All energy use at that site is assigned to that facility. Each meter for the site will only be associated with a single facility when entered into the application. Site 50 from Figure 1 is an example of a single facility site.

10

A multiple facility site could include complete sub-metering, no sub-metering or limited sub-metering. With complete sub-metering, there are several different facilities located at that site but sufficient sub-metering to identify the energy consumed by each individual facility. Site 30 is one example of a multiple facility site with complete sub-metering. In this case, the user would enter each individual facility much as the user would for a single facility site, and creates a relationship between the meter and the facilities.

15

In another case, a multiple facility site may have no sub-metering. The only meters on the site measure energy coming onto the site but not its distribution around different facilities. Site 20 is an example of a multiple facility site with no sub-metering. In this case, it is necessary to create a relationship between each meter and all the facilities that use that energy. It is also necessary to determine a division of this energy use across a facility. This division could be on the basis of proportion of total floor area, volume of the facility, or some other basis.

20

25

In a further case, a multiple facility site may have limited sub-metering. Site 70 is an example of such a site having a meter 102 covering facilities 72, 74 and 76 but having a sub-meter 104 only for facility 72. It is best in this case to create an energy map described below so that a local apportionment of energy use across the various facilities can be determined.

30

The user also enters facility details 550. The first component of this information is general information on the facility. This includes information such as facility name, when it was built, what type of facility it is and so on. The second component deals with the structure and utilisation of the facility being benchmarked, essentially the size of the facility, the materials from which it is constructed, and the frequency of use of the facility.

The invention permits an unlimited number of records for each facility containing this information. This is because usage patterns can vary quite markedly in some facilities.

In addition, renovations and refurbishments may alter some of the information contained in the record. In these cases, it is necessary to maintain a historical record of the utilisation to match the historical energy consumption.

The frequency with which these records should be updated will match the variability of the usage of the facility. A facility with very stable usage will need fairly few updates, but a facility where usage varies quite considerably on a regular basis may need relatively frequent updates, for example monthly or more frequently. Ultimately, the quality of the benchmark obtained for each facility will be determined by the quality and accuracy of the information contained in the database.

The user may then enter consumption details 560. The invention is configured to accept three main formats of consumption information. Aggregated information for any period of time, for example an annual figure, monthly figures and so on, can be entered by the user. For most sub-meters and energy sources, this sort of information will be all that is available.

Information broken down by time periods as well as dates can also be input. This allows for information from data loggers measuring half hourly blocks of consumption for reticulated electricity and gas. It also allows for profile consumption to be input which can be measured by month, business day/non-business day or time block.

The user may optionally enter tariff or pricing information 570. The entry of this information will allow the estimation of potential savings to be made through efficiency measures to be based on actual tariffs rather than an estimated national average price. Pricing is broken into three components, fixed costs, demand costs and unit costs.

5

Demand costs are expected to relate mainly to reticulated gas and electricity. In the case of electricity, this would be for demand charges per KVA. For gas, it would relate to the MDQ overruns.

10 Fixed costs also relate mainly to electricity and gas. These are costs imposed regardless of actual consumption. They may be in the form of metering charges, account management charges, and connection of charges.

Unit charges apply to all energy sources. This is the price paid per unit supplied. In the case of electricity, it is the per kilowatt price. For reticulated gas it is per GJ. For all other sources it is per volume/weight of the source, for example per litre of diesel, kilogram of coal.

It is envisaged that all prices be in a currency, for example dollars, exclusive of sales tax and after any discounts, for example direct debit, prompt payment and the like have been applied.

The fixed charges and demand charges inputs use very similar interfaces. The unit price interface is similar to that used for the consumption information.

25

Following data entry by the user, the data is stored in computer memory in the client data store 260. The resulting client data store will include data representing one or more sites operated by the organisation, data representing one or more facilities, and data representing one or more energy sources.

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As described above, in some circumstances it may be necessary to develop an energy map for a site if there are several facilities located there, if the metering of energy for these facilities is not straightforward.

- 5 There are a large number of possible metering configurations that might be found on a multiple facility site, and determining the configuration and entering it into the application can seem a daunting task. Figure 5 illustrates one method of entering this information in a simple logical manner in accordance with the invention.
- 10 The first step 600 is to list all facilities on the site. It is best to list each type of energy used by these facilities, for example electricity, gas, on-site generation, etc. Additionally for each facility, it is best to list the variable by which the consumption would be calculated on a pro-rata basis. One example could be floor area.
- 15 The next step is to list all energy meters 610 for electricity and gas. The energy meters are added to the list of all other energy sources, such as solar generation, diesel for generators, coal, etc. The annual consumption for each meter or energy source is then calculated.
- 20 It is then necessary to determine 620 whether the meter is a site level or sub-meter. A site level meter measures the energy coming onto the site. A sub-meter measures the distribution of this energy around a specific part of the site.

Alongside each meter, all the facilities that are supplied by the meter are listed 630. The
25 only facilities that should be entered against the site meters are those that are directly supplied by the site meter.

In cases where a meter/energy source supplies more than one facility, it is necessary to apportion the energy consumed across the facilities 640. This apportionment can be
30 based upon actual data, for example from energy audits measuring supply directly into

the facility, or from a pro-rata approach. It will be appreciated that the pro-rata approach is less accurate, but will enable some general comparisons to be performed.

If there is a heat plant that supplies several facilities, it is necessary to include this in the energy calculations when determining proportions of consumption from meters to facilities. This should only use the energy used for heating.


The figures calculated should also be checked manually. For example, where a facility is supplied by more than one meter for an energy source, and where those meters also supply other facilities, it may introduce an error into a simple pro-rata calculation and some adjusting may be appropriate.

Figure 6 illustrates the data compiled at the end of step 630 from Figure 5 and Figure 7 shows the data compiled at the end of step 640 from Figure 5.

Preferred fields for the client data store 260 and/or benchmark database 280 are shown in Figures 8-16. Figure 8 illustrates example organisation details, Figure 9 contact details, Figure 10 site details, Figure 11 meter details. Figures 12-1, 12-2, 12-3, 12-4 and 12-5 illustrate preferred form facility details, Figure 13 illustrates consumption details, Figure 14 illustrates pricing details, Figures 15-1 and 15-2 illustrate facility types and Figures 16-1 and 16-2 illustrate a list of indicators.

Where multiple facility sites exist with limited sub-metering, when analysing the results it is necessary to look at the results for all facilities in combination rather than specific facilities. If the results indicate that most sites are performing relatively poorly, then there may be a good case to install additional metering equipment, or perform an energy audit, to determine exactly which facilities are performing the poorest and would make the greatest gains from an in-depth energy audit.

The foregoing describes the invention including preferred forms thereof. Alterations and modifications as will be obvious to those skilled in the art are intended to be incorporated within the scope hereof.

Energy & Technical services Ltd
By the authorised agents
AJ PARK
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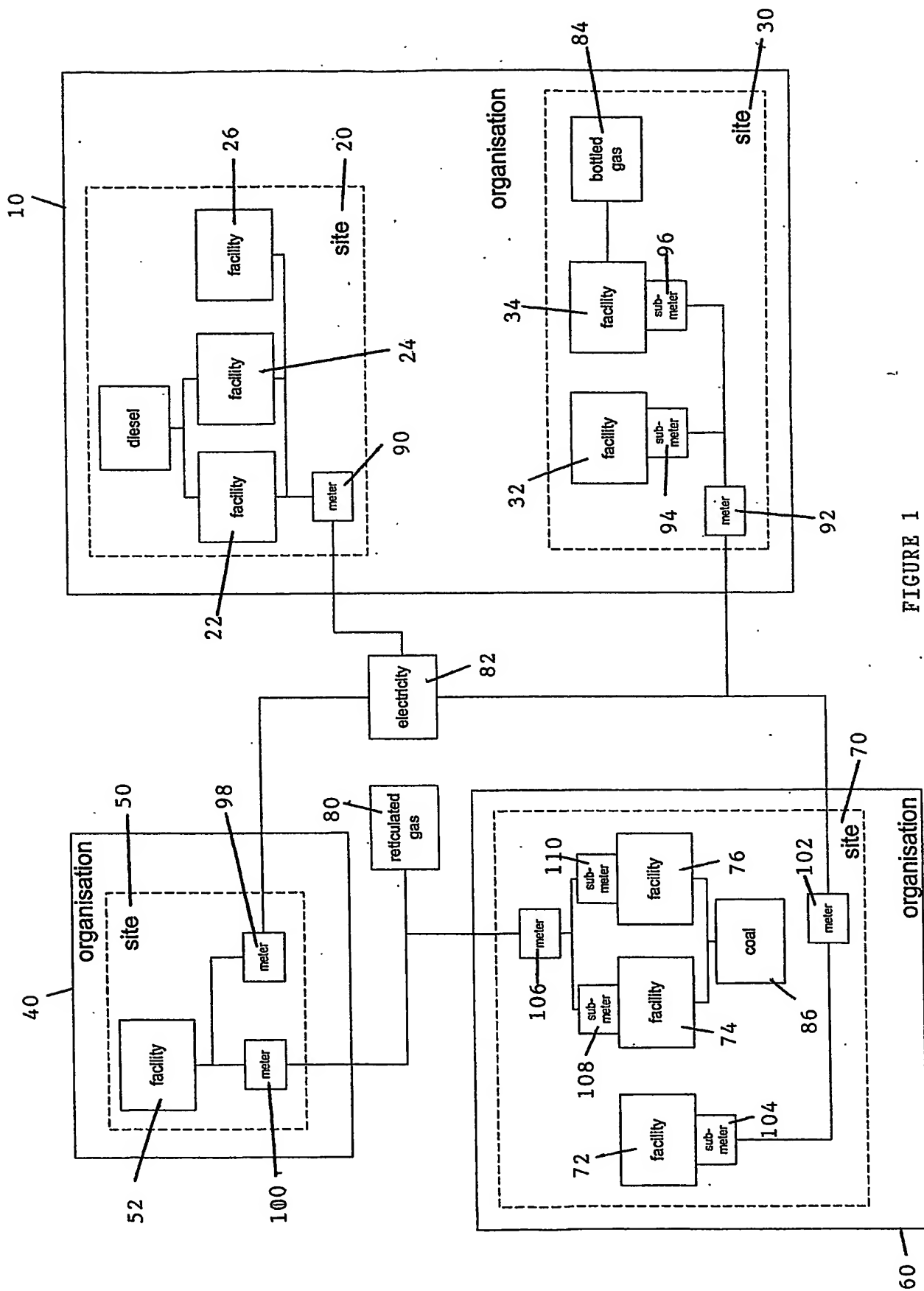


FIGURE 1

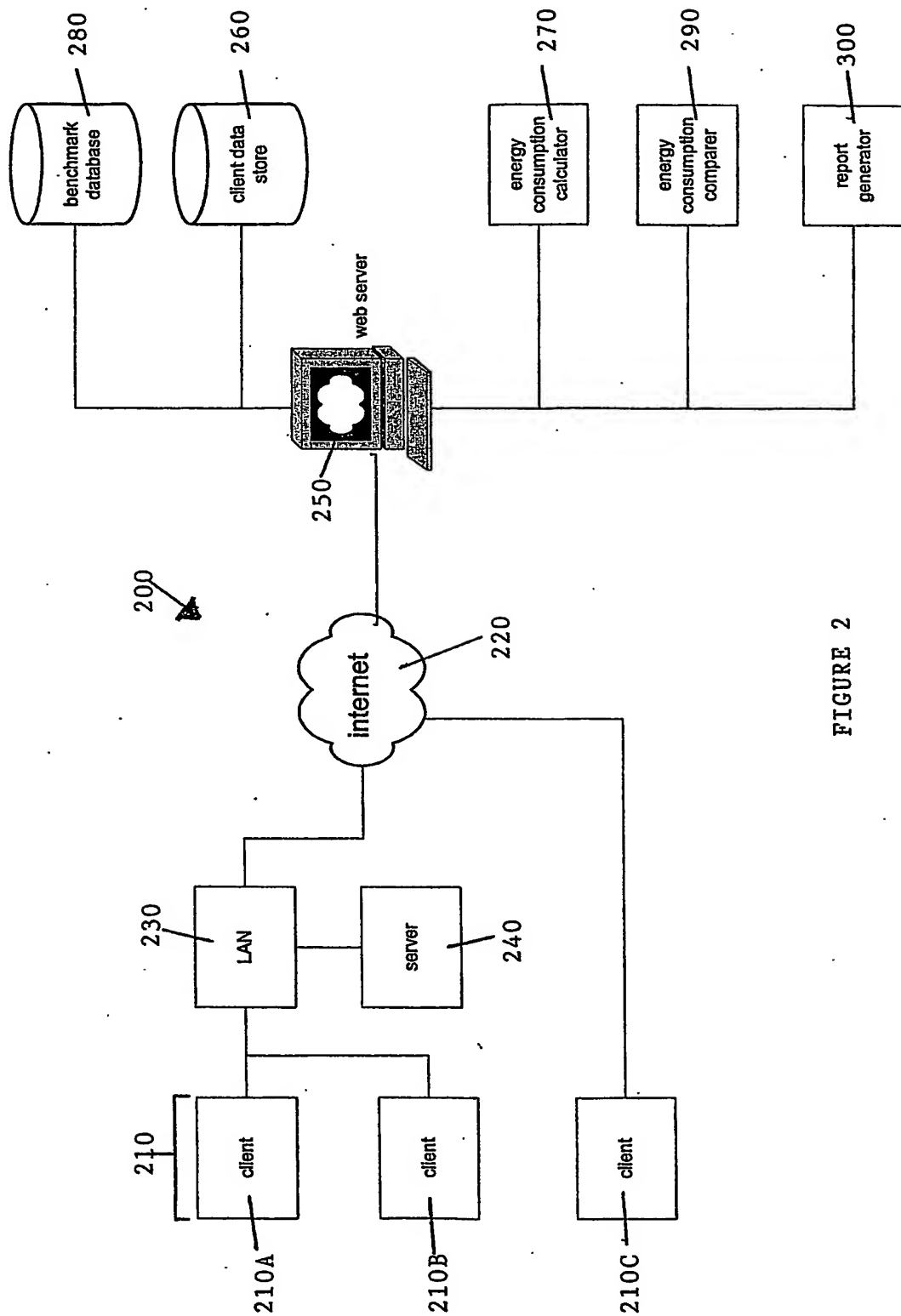


FIGURE 2

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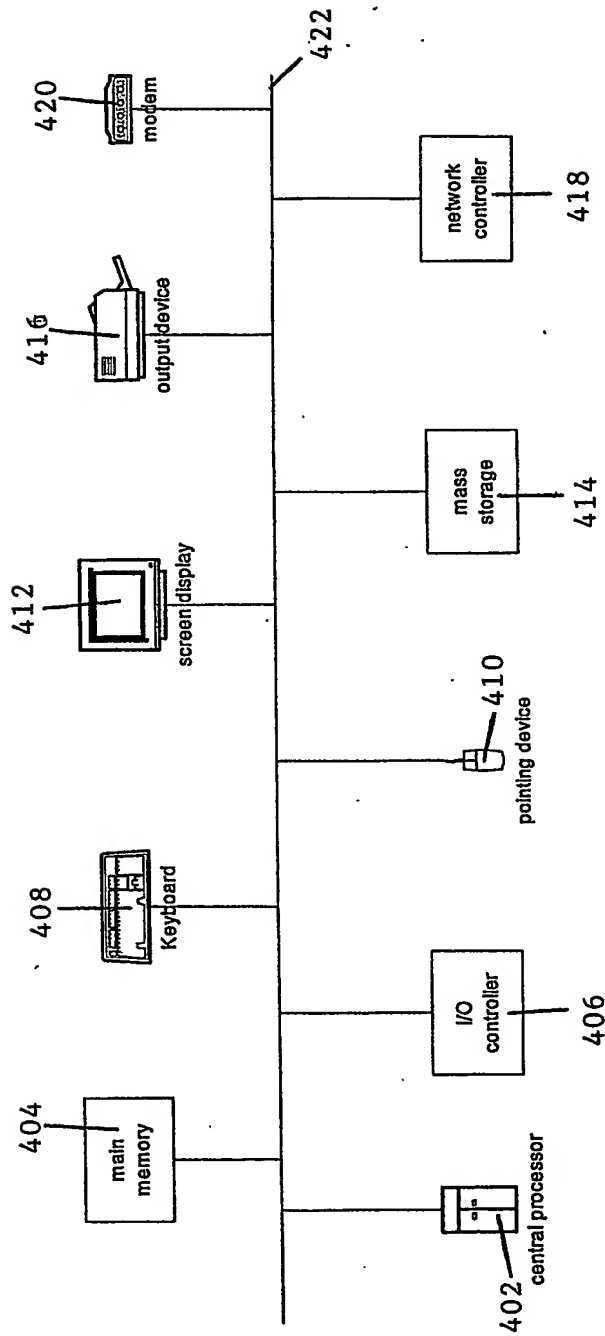


FIGURE 3

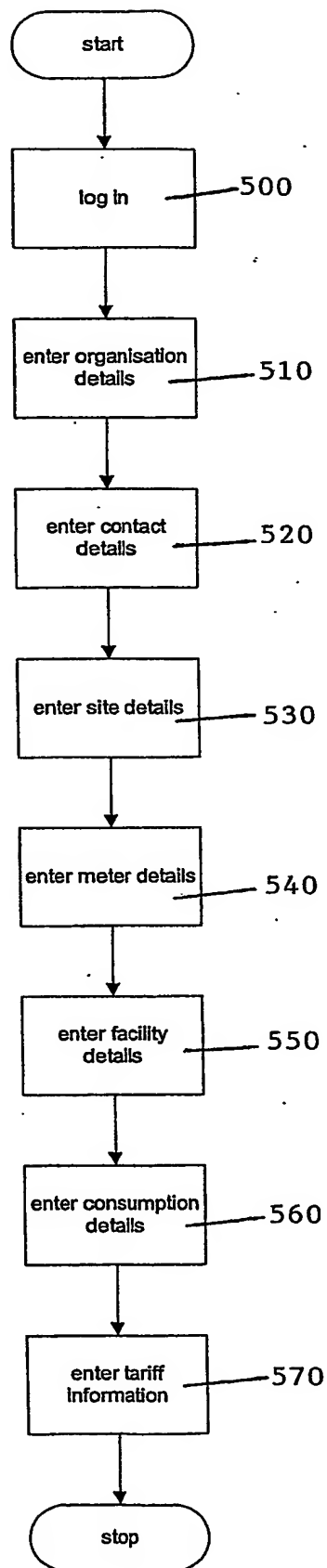


FIGURE 4

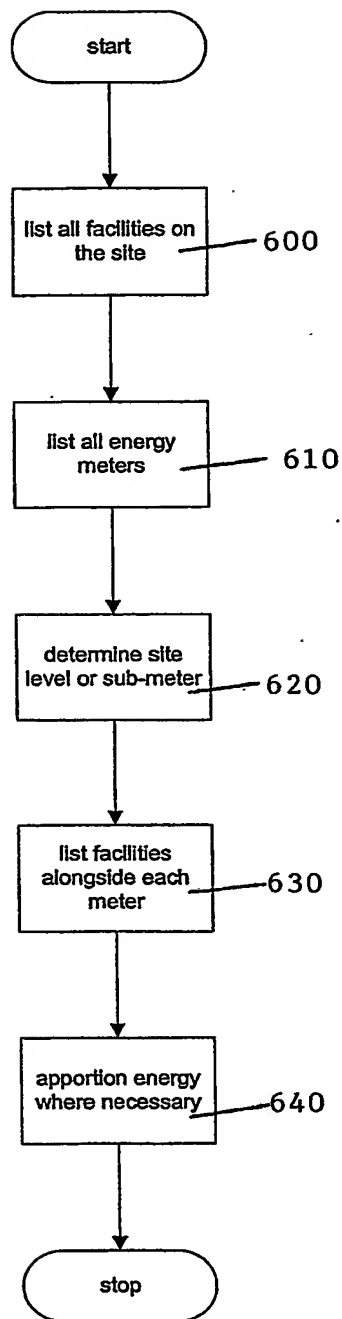


FIGURE 5

Energy Map Process at end Step 4

Facility	Energy Sources	Floor Area (000 Metres)
Admin	Elec, Diesel	15
Ward 1	Elec, Gas	25
Ward 2	Elec, Gas, Diesel	28
Laundry	Elec, Gas	4
Operating Theatres	Elec, Gas, Diesel	6
Heat Plant	Coal, Elec	0.5
Total		78.5

Meters	Energy	Ann. Consum. (000 kWh)	Sub or Site	Facilities Supplied (Directly)
Site Elec	Elec	2300	Site	Admin
ElecSub1	Elec	1000	Sub	Ward2, Heat Plant, Operating Theatre
ElecSub2	Elec	750	Sub	Operating Theatre, Ward1
ElecSub3	Elec	250	Sub	Laundry
Site Gas	Gas	1600	Site	Ward1, Ward2, Operating Theatres
GasSub	Gas	800	Sub	Laundry
Diesel	Diesel	150	Site	Admin, Operating Theatres, Ward2
Coal	Coal	850	Site	Heat Plant
Total kWh*		4900		

*This total is for site level meters only. Submeters measure a portion of this energy.

FIGURE 6

Energy Mapping Process at end Step 5

Facility	Area	Meter	Consum	%	Notes
Admin	15	Diesel	15	10%	Calculated consumption based on potential emergency/circuit loads
Admin	15	Site Elec	300	19%	Known consum is 300, only facility supplied by electricity not going through submeters
Heat Plant	0.5	Coal	850	100%	Only facility supplied by this sub-meter
Heat Plant	0.5	Elec Sub 1	14	1%	Pro-Rata based on floor area
Laundry	4	Elec Sub 3	250	100%	Only facility supplied by this sub-meter
Laundry	4	Gas Sub	800	100%	Only facility supplied by this sub-meter
Op. Theatres	6	Diesel	60	40%	Calculated consumption based on known emergency/circuit loads
Op. Theatres	6	Elec Sub 1	174	17%	Pro-Rata based on floor area
Op. Theatres	6	Elec Sub 2	145	19%	Pro-Rata based on floor area
Op. Theatres	6	Site Gas	84	11%	Pro-Rata based on floor area
Ward 1	25	Elec Sub 2	605	81%	Pro-Rata based on floor area
Ward 1	25	Site Gas	351	44%	Pro-Rata based on floor area
Ward 2	28	Diesel	75	70%	Calculated consumption based on known emergency/circuit loads
Ward 2	28	Elec Sub 1	812	81%	Pro-Rata based on floor area
Ward 2	28	Site Gas	393	49%	Pro-Rata based on floor area
Total kWh			4928		

Apportioning Heat Plant Energy

Facilities Heated	Volume	Consumption (000 kWh)	Notes
Ward 1	63	470	Pro-rata based on volume (Actual figures will be calculated by the application)
Admin	33	246	Pro-rata based on volume (Actual figures will be calculated by the application)
Op. Theatres	18	134	Pro-rata based on volume (Actual figures will be calculated by the application)
Tot Volume	114		

Check Consumption for Each Facility (total consumption / floor area)

Facility	Tot. Consum (incl heat plant)	kWh/sq. Metre
Admin	581	37
Ward 1	1425	57
Ward 2	1280	46
Laundry	1050	263
Operating Theatres	597	100
Heat Plant	14	29

FIGURE 7

Appendix A - Organisation Details

Organisation Name

Mandatory. Name of your Organisation

Organisation Website

Please enter the address of the website of the organisation (if a website exists). Please only enter the part of the address that follows the 'http://' component (i.e. www.energyts.com).

Organisation Type

Predefined. Choose the appropriate Organisation Type from the dropdown list. If none seem appropriate choose 'Other' and contact ETS so we can update the list.

Address

Mandatory. Please enter the postal address for your Organisation.

FIGURE 8

Appendix B – Contact Details

Position

The Position held / Job title of this person.

Title

Please insert the title of this contact (i.e. Mr, Mrs, Miss, Dr, etc).

First Name / Surname

Mandatory. The First Name and Surname of this contact person.

Email

Mandatory. Please enter the full email address for this person.

Address

Mandatory. Please enter a physical (courier) address for this person.

DDI / Extension

Mandatory. Please enter the landline number to reach this person (plus extension number if necessary). Include the area code.

Mobile

User Assigned. Please enter a mobile phone number to reach the person.

Fax

User Assigned. Please enter a fax number for this person. Include the area code.

Appendix C – Site Details

Region

Predefined. Mandatory. Choose the appropriate region from the drop down list. The selection should be based on the closest location with the most similar year round temperatures.

Site Name

Mandatory. Enter the name of the site sufficient for you to be able to readily identify it from a list of all your sites.

Site Description

This is an optional field where any information and notes you consider useful may be entered.

Site Start

Approximate date on which the site was first opened, if known. Will default to 1-Jan-1900 if left blank.

Site Finish

Date on which the site closed or left the ownership of your Organisation.

Address

The physical location/address of the site.

Indicator Period

The year for which the site level indicators apply. This will be determined by the norms for different industry groups.

Site Indicator 1

This is an indicator used when preparing a site level efficiency indicator. These indicators will be particular to different industry groups.

Site Indicator 2

This is an indicator used when preparing a site level efficiency indicator. These indicators will be particular to different industry groups.

Site Indicator 2

This is an indicator used when preparing a site level efficiency indicator. These indicators will be particular to different industry groups.

FIGURE 10

Appendix D - Meter Details

Energy

Predefined. Mandatory. Please choose from the drop down list which energy source this meter is measuring.

Meter Type

Applies to reticulated Gas and Electricity only. Predefined. Mandatory. Please select from the drop down list the type of metering installed to measure consumption of these energy sources.

GXP / Network Company

Applies to reticulated Gas and Electricity only. Predefined. Please select from the drop down list the distribution network company maintaining the connection to your site. Alternatively for Electricity please select the Grid Exit Point from the National Transmission Grid if known.

ICP

Applies to reticulated Gas and Electricity only. Please enter the ICP (Installation Control Point) number assigned to your site. This can usually be found on the bill.

Rating

Applies to reticulated Gas and Electricity only. For Electricity please enter the KVA rating for the connection. For Gas please enter the assigned MDQ (Maximum Daily Quantities – GJ's) for the connection.

MHQ

Applies to reticulated Gas only. Please enter the Maximum Hourly Quantity assigned to the connection (GJ's)

Meter Start

Mandatory. The date from which these meter details are applicable.

Meter Finish

The date until which the above meter details are applicable. This can also indicate instances where an energy source is no longer used (i.e. coal being phased out/replaced by other energy sources such as gas).

Local Meter ID

An optional field to fill in any identifier used within the Organisation to identify this meter / energy source.

Local Meter Name

An optional field for entering a name for this meter. Especially useful for quick differentiation when there are a number of sub-meters on a site.

Meter Level

Predefined. Mandatory. Choose from the dropdown list which level of metering applies for this meter. The Site Meter option is for a meter that measures the energy entering the site (facilities may be directly supplied from this meter). The Sub-Meter option applies when the meter measures energy usage subsequent to that energy passing through a Site Meter. Sub-meters are used to measure energy use at a specific facility or group of facilities.

% Consumption

User assigned. Mandatory. Used to determine the amount of energy passing through the meter that is consumed by a facility connected to that meter. It should be 100% in all cases where all the consumption of the meter is used by a single facility. In other cases it should be determined after an energy map has been created (see Appendix E).

Appendix F – Facility Details

Facility Type

Predefined. Mandatory. Please choose from the drop down list the Facility Type that best describes the main use of this facility. If none of the options seem appropriate please select 'Other' and contact ETS so we can update the list. See Appendix I for a list of Facility Types and their definitions.

We recognise that many buildings are used for a number of different purposes. This is taken into account using sub-facilities that are detailed in the utilisation section later in this guide. However it is necessary to assign a primary purpose to the facility for comparisons to be made. This primary purpose should be the one that uses the majority of energy in the facility.

Facility Name

Mandatory. Please enter information that will allow you to easily differentiate the facility from others (e.g. building name).

Facility Description

Please enter any additional information or notes that further describe the facility.

Facility Open

Mandatory. Enter the date the facility opened for its current use.

Facility Close

Enter the date the facility was closed for its current use or was demolished.

Facility Built

Enter the date the facility was built. This may be different from the Facility Open date above.

FIGURE 12-1

Utilisation

% Windows

Mandatory. Percentage of total exterior wall area comprised of windows.

Air Changes

Air-conditioned facilities only. The typical number of air-changes per hour.

Air Conditioning

Yes / No. Does the facility have an air-conditioning system.

Air-Con Area (%)

Air-conditioned facilities only. The percentage of the floor area of the facility that is air-conditioned.

Air-Con Control

Air-conditioned facilities only. Select from the dropdown list the control system that most closely reflects that used for the air-conditioning in this facility.

Air-Con Filter

Air-conditioned facilities only. Select from the dropdown list the filtration system that most closely reflects that used in this facility.

Attendance Hours

Entertainment & Lecture Theatre Facilities only. Mandatory. Attendance (number of people) times hours of 'showtime', per week.

Batch Laundry

Laundry Facilities only. Mandatory. The amount of laundry washed per week (kilograms) in a batch process.

Bench Area

Laboratory Facilities only. Mandatory. The total laboratory bench area in the facility (square metres).

Books

Library Facilities only. Mandatory. The number of books stored in the facility.

Building Management System

Yes / No. Does the facility have installed a computerised Building Management System.

Building Shape

Predefined. Mandatory. Select from the dropdown list the building shape that most resembles the actual shape of the building / facility.

Computers

Computer Services/Computer Labs only. Mandatory. The total number of computers (PCs, Servers, etc) in the facility.

Continuous Laundry

Laundry Facilities only. Mandatory. The amount of laundry washed per week (kilograms) in a continuous cycle process.

Customers

Café/Canteen Facilities only. Mandatory. Average number of customers per week.

Days Used

Changing Sheds only. Average number of days used per week.

Details Finish Date

Enter the date until which the above details were applicable to.

Details Start Date

User Assigned. Enter the date on which the above details were first applicable from.

Exposure

Predefined. Please select from the dropdown list the level of exposure to wind and direct sunshine that most corresponds to that experienced by this facility.

Floor Area

Mandatory. Total area of covered floor space within the facility (square metres).

Floor Material

Mandatory. Select from the dropdown list the floor material option that most closely reflects the construction of the floor/foundations.

Full Time Equivalents

Administration / Office Facilities only. The number of full time equivalent (FTE) staff working in the facility. Every 40 hours per week of staff time should be regarded as an FTE.

Glazing

Predefined. Mandatory. Select from the dropdown list the glazing option that most closely reflects the type of glazing used in exterior windows.

Heating Control

Predefined. Mandatory. Select from the dropdown list the control system that most closely reflects that used in this facility.

Heat Losses

Heat Plant Facilities only. The level of heat losses during transportation from the heat plant to facilities, as a percentage of heat generated.

Heat Plant

Predefined. Select from the dropdown list the heat plant that supplies energy to this facility. The heat plant must have already been entered into the application as a facility.

Humidity

Indoor Swimming Pool Facilities only. The maintained level of humidity for the majority of the facility volume (percentage).

Income

Café / Canteen Facilities only. Mandatory. Average weekly income (\$) of the facility.

Kilometres Covered

Street lighting only. Mandatory. The length of roading covered by streetlights (Kilometres).

Lighting Control

Predefined. Mandatory. Select from the dropdown list the control system that most closely reflects that used in this facility.

Lit Area

Outdoor Lighting only. Mandatory. The total area under lighting (square metres).

Luminaires

Outdoor & Street Lighting only. Mandatory. The number of lights installed for lighting the area.

Lux

Outdoor & Street Lighting only. Mandatory. The average level of lighting (in lux) maintained in the area.

Maintained Temperature

User Assigned. The target temperature that the facility is maintained at.

Number of Beds

Dorm & Ward Facilities only. The number of beds contained within the facility.

Number of Occupants

Residential Facilities only. Mandatory. The number of occupants in the residential facility per day.

Occupancy

User Assigned. Mandatory. The percentage of the week that the facility is occupied. Note – total of 168 hours in a week.

Occupied Bed Days

Dormitory & Ward Facilities only. The average number of occupied bed days in a week. An occupied bed day is essentially a bed that is occupied over night.

Operating Hours

Operating Theatre Facilities only. Mandatory. The total number of hours per week each operating theatre is in use. E.g. A facility has two operating theatres and they are each used an average of 20 hours per week. The total would therefore be 40 hours.

Orientation

Predefined. Please select from the dropdown list the orientation that most corresponds to that of the facility. The decision should be based upon which side of the building has the greater requirements for heating/cooling.

Parks

Parking Facilities only. Mandatory. The number of car parks within the facility.

Pipe Diameter

Flood & Water & Sewerage Pumping Facilities only. The diameter (metres) of the pump piping.

Re-circulation Time (hours)

Indoor & Outdoor Swimming Pools only. Mandatory. The time taken (in hours and fractions of hours) for the total volume of pool-water to be re-circulated through the filtration system.

Roof Area

Mandatory. The surface area of the roof (square metres).

Roof Material

Mandatory. Select from the dropdown list the roof material option that most closely reflects the construction of the roof.

Seats

Entertainment & Lecture Theatres only. Number of seats in the facility.

Storeys

Number of storeys (including underground/basement levels).

Sub-Facilities

Yes / No. Does this facility have any other energy using facilities that are significantly different to the main usage. An example might be an office building which also has some retail space, and/or apartments.

Sub-Facility Type

Predefined. Choose from the dropdown list the Sub-Facility Types that are located within this facility.

Sub-Facility Indicator 1

While not yet defined, this field will be used in future updates to allow for sub-facilities within a facility to have corrections for a share of consumption, and therefore increase the accuracy and relevance of the overall indicator.

Sub-Facility Indicator 2

While not yet defined, this field will be used in future updates to allow for sub-facilities within a facility to have corrections for a share of consumption, and therefore increase the accuracy and relevance of the overall indicator.

Surface Area

Outdoor & Indoor Swimming Pools only. The total surface area of all swimming pools in the facility (square metres).

Theatres

Operating Theatre Facilities only. Mandatory. The number of operating theatres in the facility.

Visitors per Week

Mandatory. The average number of visitors per week.

Volume

Mandatory. The volume of the building (cubic metres).

Volume Heated

Heat Plant Facilities only. Mandatory. The total volume of all facilities that are heated by this heat plant.

Volume Pumped

Flood & Water & Sewerage Pump Facilities only. The volume of water pumped per week (litres).

Volume Treated

Water & Sewerage Treatment Facilities only. Mandatory. The Volume of sewerage treated per week (litres).

Wall Area

User Assigned. Mandatory. Total area of exterior wall surface (square metres).

Wall Material

Predefined. Mandatory. Select from the dropdown list the wall material option that most closely reflects the construction of the exterior walls.

Water Temperature

Outdoor & Indoor Swimming Pools only. The maintained temperature of the majority of water in the swimming pools.

Water Volume

Outdoor & Indoor Swimming Pools only. The total volume of water (including in the recirculation / filtration system) for all swimming pools in the facility.

Appendix G – Consumption Details

Reading Type

Reticulated Gas and Electricity only. Predefined. Mandatory. Please select the appropriate reading type from the drop-down list for reticulated gas/electricity.

Day Type

Time of Use metered electricity and gas only. Predefined. Select the appropriate day-type from the drop down list.

Consumption Start Date

Mandatory. Date on which consumption of this block of energy started.

Consumption Finish Date

Mandatory. Date on which consumption of this block of energy ended.

Consumption Start Time

Time of Use metered electricity and gas only. Time of day at which consumption of this block of energy started.

Consumption Finish Time

Time of Use metered electricity and gas only. Time of day at which consumption of this block of energy ended.

Consumption

Amount of energy consumed during the current period (kWh). Or:

Volume Consumed

Volume consumed of the energy source (e.g. kilograms of coal, litres of diesel, GJ of gas etc.). The consumption figure above (kWh) will be calculated from this.

KVA

Time of Use metered electricity only (optional). The KVA reading during this block of consumption.

FIGURE 13

Appendix H – Pricing Details

Fixed / Demand Charges

Tariff Start Date

The Date from which this tariff was available.

Tariff End Date

The Date from which this tariff is no longer available.

Period

The period that this charge applies for – i.e. is it on a weekly basis, monthly, daily etc.

Energy

This charge is for the energy (retailer) component of the fixed / demand charges. Only applies to reticulated electricity and gas.

Network

This charge is for the distribution component of the fixed / demand charges. Only applies to reticulated electricity and gas.

Bundled

This charge is the total charge applied to fixed / demand charges. It should be the sum of the energy and network charges if these have been entered.

Unit Charges

Day Type

Time of Use metered electricity and gas only. Predefined. Mandatory. Select from the drop-down list the appropriate day type.

Price Start Date

Mandatory. Date from which this specific price started.

Price Finish Date

Mandatory. Date from which this specific price ended.

Price Start Time

Time of Use metered electricity and gas only. Time of day at which this price started.

Price Finish Time

Time of Use metered electricity and gas only. Time of day at which this price ended.

Retailer Price

This charge is for the retailer (sometimes known as energy) component of the unit charges. This figure should include local losses (electricity).

Network Price

Applies to reticulated electricity and gas only. This charge is for the distribution (sometimes referred to as lines) component of the unit charges.

Bundled Price

This is the total charge applied to unit consumption. It should be the sum of the retailer and network charges if these have been entered.

Appendix I - Facility Types

Administration / Offices

A Building/Facility that is primarily used for administration work. Essentially made up of open plan office environments and/or offices. Generally used on a working day, 9-5 basis.

Cafeteria / Canteen

A Building/Facility primarily used for the preparation and consumption of food.

Changing Sheds

A Building/Facility primarily used as changing rooms. For example ...

Dormitories

A Building/Facility primarily used as a dormitory or hostel. This does not include apartment blocks or blocks of flats (refer also Residential Facilities).

Enclosed Spaces / Foyers

This refers to large indoor spaces that are used as entrance foyers, gathering places, atriums, or similar.

Entertainment Theatre

A theatre attended for entertainment purposes, such as operas, plays, or movies.

Flood Pumping Station

A pumping station primarily used for pumping flood, storm, and drain water.

Gallery

A facility used for the storage and display of art and similar types of objects.

Gymnasium

A facility used for recreational purposes such as weight training, squash etc.

Heat Plant

A facility that generates heat for use by other facilities.

Hospital Wards

A facility used for the housing and care of hospital patients. Patients usually stay overnight.

Indoor Swimming Pool

A recreational swimming pool kept in an enclosed environment (indoors).

Laboratories

A facility used primarily as laboratories for the purposes of research, measurement, or education.

Laundry

A facility used to launder clothes and linens.

Lecture Theatres

A theatre used for lectures and/or conferences.

Library

A facility used for the storage and display of books. These facilities will tend to have fairly specific requirements for temperature and humidity.

Museum

A facility for the storage and display of art, historical documents, archaeological artefacts, and objects from the natural world.

Operating Theatre

Hospital facilities used for performing surgery.

Outdoor Lighting (Public) / Unenclosed Spaces

Areas that are exposed to weather which are lit for the purposes of public safety and convenience.

Outdoor Swimming Pool

A swimming pool that is not enclosed within another structure.

Parking Building

Building used for car-parking.

Residential Facilities

Intended to encompass apartment buildings and large blocks of flats. The energy consumption should be for the entire building/block, and not just for communal areas (e.g. stairwells/corridors etc).

Sewerage Pumping Station

A pumping station used for pumping sewerage.

Sewerage Treatment Plant

A plant used for processing and treating sewerage in order to minimise any harm caused by its discharge.

Street Lighting

Lighting used on streets to illuminate the road, intersections, and areas of potential danger (e.g. outside shops, pedestrian crossings etc).

Toilet Block

A block of toilets and bathrooms.

Water Pumping Station

A pumping station used for pumping water around a mains system, or from a water source.

Water Treatment Plant

A plant for treating water to ensure its safety for public consumption.

Appendix J – List of Indicators

Per sq. meter of pool surface (Annualised)

Indoor swimming pool/Outdoor swimming pool

Per sq. meter of flooring (Annualised)

Library/Laboratories/Administration (Office) blocks/Hospital wards/Dormitories/Residential/Museums/Gymnasiums/Large enclosed public spaces/Galleries/Changing Sheds/Canteens/Operating Theatres

Per Computer (Annualised)

Computer Services / Computer Labs

Per visitor (Annualised)

Museums/Cafeterias/Gymnasiums/Galleries/Toilet Blocks

Per cubic meter of water pumped (Annualised)

Flood pumping/Sewerage pumping/Water pumping

Per cubic meter of treated liquid (Annualised)

Sewerage treatment/Water treatment

Per occupied bed day (Annualised)

Hospital wards/Dormitories

Per seat (Annualised)

Lecture theatres/Public theatres

Per hour of attendance (Annualised)

Lecture theatres/Public theatres

Per full time equivalent staff member (Annualised)

Administration (office) blocks

Per car park (Annualised)

Parking buildings

Per 1000 books (Annualised)

Libraries

Per sq. meter of laboratory benches (Annualised)

Laboratories

Per occupant (Annualised)

Residential Facilities

Per sq. meter of lighted area (Annualised)

Outdoor lighting

Per luminaire (light fitting) (Annualised)

Outdoor Lighting/Street lighting

Per km of lighted road (Annualised)

Street lighting

Per cubic meter heated volume (Annualised)

Heating Plant

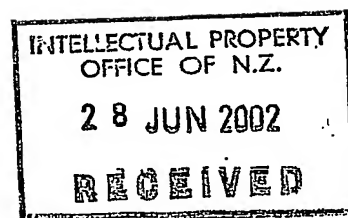
Per kilogram of washing (Annualised)

Laundries

Per Operating Hour (Annualised)

Operating Theatres

FIGURE 16-2



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